

# Claims

1. Device to generate excited and/or ionized particles in a plasma from a process gas with a generator (11) to generate an electromagnetic wave, a coaxial conductor (30) in which the electromagnetic wave is guided, and at least one plasma zone (20) in which the excited and/or ionized particles are formed by the electromagnetic wave, characterized in that an inlet (17) is available for inlet of the process gas into an interior chamber (31) of the coaxial conductor (30) between an outer conductor (18) and an inner conductor (19), and that the inner chamber forms the plasma zone (20).

2. Device according to Claim 1, characterized in that the generator (11) is a magnetron to generate an electromagnetic wave. *CLAIM 1*

3. Device according to ~~one of Claims 1 or 2~~, characterized in that the inner conductor (19) of the coaxial conductor (30) is manufactured from metal, from metal coated with oxide or quartz or from metallized oxide or quartz. *CLAIM 1*

4. Device according to ~~one of Claims 1 or 3~~, characterized in that the outer conductor (18) of the coaxial conductor (30) is manufactured from metal, metal coated with oxide or quartz, or from metallized oxide or quartz. *CLAIM 1*

5. Device according to ~~one of Claims 1 to 4~~, characterized in that the inner conductor (19) and/or the outer conductor (18) of the coaxial conductor (30) are cooled by means of cooling, in particular, by a water cooling. *CLAIM 1*

6. Device according to ~~one of Claims 1 to 5~~, characterized in that the electromagnetic wave is guided by means of an impedance converter (12, 15) into the coaxial conductor (30).

7. Device according to Claim 6, characterized in that the impedance converter (12, 15) is composed of a hollow waveguide (12) and impedance transformer cone (15). *CLAIM 6*

8. Device according to ~~one of Claims 6 or 7~~, characterized in that between the generator (11) for the electromagnetic wave or the impedance converter (12, 15) and the plasma zone (20), there is a transport region (50) in which the electromagnetic wave is transported essentially without loss.

9. Device according to Claim 8, characterized in that the transport region (50) is formed as a coaxial conductor. *CLAIM 1*

10. Device according to ~~one of Claims 1 to 9~~, characterized in that the length of the plasma zone (20) is variable. *CLAIM 1*

11. Device according to ~~one of Claims 1 to 10~~, characterized in that a magnetic system (40) is provided.

12. Device according to Claim 11, characterized in that the magnetic system (40) is composed of at least one magnetic field coil (42) on the outside of the outer conductor (18).

0065200-022400